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ABSTRACT

This report describes current book deterioration in libraries, the status and economics of acid free paper production, and categories of books which should be printed on acid-free paper. Recommendations are discussed for publishers and librarians regarding the use of acid-free paper. Technical guidelines on paper acidity, a table on manufacturers of acid-free paper identifying types, shades, and surfaces of paper as well as definitions and a list of members of the Committee on Production Guidelines for Book Longevity of the Council of Library Resources are provided. (Author/RBF)

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THE COMMITTEE ON PRODUCTION GUIDELINES

FOR

BOOK LONGEVITY

Interim Report on Book Paper

April, 1981.

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In the past few years there has been increasing awareness that millions of books and other documents all over the world are disintegrating. We are in danger of losing more than a century of the human record--since the early 19th century when paper manufacturers began the widespread use of processes that left acidic residues in paper. Such residues in the presence of light, heat, moisture, and air hasten the process of deterioration of the cellulose fiber, thus weakening the paper. For example, over six million volumes in the Library of Congress are now so brittle that their survival is threatened. Much effort has been expended, with very modest success, to devise economical ways of preserving these books. Much more needs to be done.

Our concern here is not with preserving the books of the past, but rather those of the future. Books containing the acidic seeds of their own destruction continue to be produced by the millions, storing up problems for the future, failing to provide a permanent record of our own times.

Our Committee on Production Guidelines for Book Longevity was formed by the Council on Library Resources, with help from the A.W. Mellon Foundation, to seek ways to encourage the production of publications that will last, especially books. We recognize that this is a herculean task. It would be useless for us to ignore economic forces; recommendations for improvement must stand the harsh test of the marketplace. Nevertheless, as we shall explain, we are optimistic. Some technological factors are working for us. Much can be accomplished through more awareness, through good will, and through cooperation, without adding substantially or even at all to the cost of many books.

Who's to blame? The public has awarded the largest share of blame for our present situation to the paper manufacturers, but are they at fault? Have they not, with enormous investment, met the demand of publishers for

low-cost book paper, and has not this availability led to the huge expansion of reading? Until thirty years ago paper mills were not able to produce acid-free book paper at competitive prices, but now they can. Others say that poor paper standards are the fault of the publishers, but publishers have met the need of the public for low-priced books, and until recently few complained about paper permanence. The problem has been recognized since the 1950's, and even today librarians, who worry about prices and about preservation of old books, seldom ask about the structural quality of what they buy. Permanence was not a conscious part of book production decision-making. The problem is big and complicated; no one group is to blame, and exigencies of the day tend to push the problem aside to be dealt with by the librarians and the readers of the future.

What is being done? Actually, without a major effort, the situation is improving gradually. For reasons having nothing to do with permanence, the processes for making acid-free book paper were developed in the 1940's. Although the problem of disintegrating books was recognized much earlier, not until the Barrow reports of 25 years ago did publishers pay any attention. At that time, in response to a brief outcry from librarians, several publishers announced that henceforth they would use only acid-free paper. But lack of commitment and shortages in supply caused the practice to be abandoned except by a few publishers. Recently both economic forces and the anti-pollution laws have increased interest in acid-free paper production. The trend is slow because the necessary technological changes are expensive (a large new paper machine costs more than $100,000,000), but it appears that in another decade the effects may be substantial. We estimate that in 1980

about 25% of paper manufactured in America for use in book production was acid-free (about 225,000 tons of a total of 840,000). This percentage will probably increase by 1990. Can we hasten this transition? In the long term production responds to demand.

It should be recognized, however, that there are some strong opposing forces, especially the increasing use of groundwood, primarily in mass-market paperbacks and some textbooks. This use may be extended to other books too. Groundwood in any amount causes paper to deteriorate quickly. It is our hope that the increasing use of acid-free paper will offset the use of groundwood papers for books that need preserving. There is more groundwood paper, but there is also more acid-free paper.

What ought to be done? Should all book production, to say nothing of all other publications, be produced on "permanent" paper? That seems absurd. Much printed matter is made to be read and thrown away--newspapers, magazines, paperbacks. If they could be made permanent at no extra cost, no one would object, but it hardly seems reasonable to insist that they be manufactured to last for centuries. To the extent that they are wanted, other ways will have to be found to preserve them, probably mainly by microphotography. Much the same could be said of many books, though with hardbound books it becomes more difficult to make distinctions. Even the most ephemeral popular books (like magazines and newspapers) are part of the record of our civilization and will be of interest to future generations. Still, distinctions can be made. Many books--especially scientific and scholarly books and serious works of fiction and non-fiction--are culturally valuable and must be preserved in some form.

At a recent meeting of librarians, publishers, and paper manufacturers it was suggested that the following categories of books ought especially to be printed on acid-free paper: primary printed sources, important works of fiction and nonfiction, collected editions, bibliographies, guides to collections, yearbooks, gazetteers, scholarly periodicals and monographs, dictionaries, encyclopedias, and other reference books.

With some trepidation it was suggested that the following categories need not be on acid-free paper: workbooks, textbooks, anthologies, vanity publications, athletic and political hagiography, popularizations in all fields, novelizations of films, formula novels, and most paperbacks.

These lists cannot be definitive, but they can indicate directions. Ultimately publishers will have to make judgments. The aims of our committee would be largely realized if publishers would be more aware of the need for "permanence" and would make thoughtful decisions about the paper used to print their books. Publishers are proud of their books; they have the knowledge to make such judgments. They should remember, too, that not only libraries want "permanent" books. Book lovers of all kinds have a right to expect, when they buy an expensive art book or children's book or novel, that it will not disintegrate.

Cost. Acid-free paper need not be more expensive than acidic paper of the quality normally used in hardbound books.

Availability. The paper industry is huge; only a little over 1% of its total production is book publishing paper. Hence the book industry can have very little influence on the paper industry as a whole. Moreover only a portion of book paper is used for hardbound books; we have already acknowledged that most paperbacks are by definition ephemeral. So, in seeking paper

that will last we are concerned with a relatively small amount of production which can be supplied perhaps by fewer than ten companies. Publishers should use present acid-free production wisely, and we need to encourage the development of more acid-free mills. In recent years the demand for paper has risen, and book paper has sometimes been in short supply. In such conditions publishers will use what they can get. The supply in the next five years promises to be better.

Recommendations. Table I supplies information on the products of manufacturers producing acid-free paper. We offer guidelines that we think are desirable and economically reasonable, and we encourage publishers who follow the guidelines to make an appropriate statement to appear just below the copyright line. We suggest, for example:

> The paper in this book meets the guidelines for permanence and durability of the Committee on Production Guidelines for Book Longevity of the Council on Library Resources.

Identification of acid-free books is important because book-buyers, especially librarians, need to know which books may require special care in the future or special storage conditions now. Libraries spend millions on preservation; often it is necessary to microfilm books to preserve their contents. To the extent that acid-free books are identified, these procedures will be less costly. Funds saved could be used to enlarge collections.

We encourage libraries to make their needs heard, especially to those publishers producing books that are purchased mainly by libraries, and also to general publishers. The library market is significant to every hardback book publisher. The American Library Association should encourage publishers to produce long-lasting books.

The U. S. Government is the largest publisher in the United States, and nearly all of its productions are on highly acidic paper. We encourage libraries to make their voices heard to the Joint Committee on Printing and to other government agencies issuing documentary publications of long-range importance. The American Library Association, the Association of Research Libraries, and other such groups should offer their services in helping to determine which categories of publications should be issued in permanent form.

Durability. Until now we have spoken only of chemical disintegration. Books also fall apart for other reasons. Book papers need not only "permanence" but "durability," the ability to withstand folding and tearing. Without going into detail here, we shall recommend guidelines for minimum folding and tearing qualities. In a later report we shall discuss binding materials, which are obviously important too. But here we have focussed attention only on the inside of a book, essentially its paper, because if that disintegrates a long-lasting binding is superfluous.

Production realities. Publishers do not usually buy paper for an individual title. They buy paper by the carload or in minimum quantities of perhaps 10,000 pounds, in standard sizes, for use in a variety of books as needed. The production of groups of books, all in the same trim size and with identical paper, will be arranged for economy in printing and binding. Under these conditions a publisher cannot usually choose a particular sheet for a particular book. He carries a stock of several different sheets in a few different sizes and makes his choice for each book from among these. We urge publishers and especially their production managers, to stock at least some acid-free sheets for use on appropriate groups of books.

Mills. The largest mills routinely producing acid-free paper at competitive prices are Warren, Glatfelter, and (for lightweight paper) Olin. There are also a number of smaller mills (no mill is small) producing good acid-free sheets, often specialty sheets for art books and the like. Table I in the Appendix lists acid-free mills and some of the sheets they produce. Publishers are urged to refer to this table when purchasing paper.

APPENDIX

Guidelines. Although there are unresolved technical arguments about the validity of artificial aging tests, everyone agrees that acid causes paper to disintegrate. A pH of 7 is neutral[1/]; a higher pH is alkaline while a lower pH is acidic. A pH slightly higher than 7 is desirable because the pH of paper tends to become lower and more acidic over time due to chemical processes. Papers containing groundwood should be avoided entirely since groundwood deteriorates rapidly. Other characteristics of paper (opacity, printability, flexibility, etc.) may be affected by acid content, but we are confident that for any publication requiring permanence a suitable sheet can be found, without excessive cost, within the following guideline[2/]:

> Minimum pH of 7.5 (cold extraction, Tappi T-435)
>
> Minimum cross-direction folding endurance of 30 double folds at 1 kg. tension (25 replicates, Tappi T-511)
>
> Minimum average machine direction tear resistance: (Elmendorf, 10 replicates, 8-ply tears, Tappi T-414) of 70 grams
>
> Minimum alkaline reserve (calcium or magnesium carbonate or both) of 2% based on oven dry weight

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[1/] pH is a symbol denoting the negative logarithm of the hydrogen ion concentration, in grams per liter, of a solution; it expresses relative alkalinity and acidity. The concentration of the free hydrogen ions is expressed as an exponent, so that pH4 is ten times more acidic than pH5 and one hundred times more acidic than pH6.

[2/] These guidelines are adapted and simplified from the standards set by the National Historical Publications and Records Commission, the Library of Congress, and from the ASTM/ANSI Standard Specification for Bond and Ledger Papers for Permanent Records.

This standard applies specifically to uncoated 60 lb. paper (basis 25 x 38/60) or 90 gm./m^2.

The paper should be made of cotton or fully bleached wood pulp (or a mixture) and should include no unbleached wood pulp or groundwood.

No acid or chloride printing inks should be used.

Most books are printed on uncoated paper. Regardless of the weight, the pH factor should be maintained. For a given quality of papermaking materials, lower weight will mean less resistance to tearing and less endurance in folding. Depending on expected use, reduced folding and tearing characteristics may be tolerable.

The question of coated paper is not treated separately in this report. Modern coatings in general have a helpful effect on permanence, but pH standards should nevertheless be maintained. Fold and tear-test guidelines as given above apply to uncoated paper only.

TABLE 1

PUBLISHING PAPER TABLE - ACID-FREE GRADES[1/]

1. Grades for General Publishing

Paper manufacturer and location	Type of Paper	Shades	Available Surfaces
S.D. Warren Div., Scott Paper Co. Westbrook, Me. Muskegon, Mich.	uncoated	white cream	antique eggshell machine finish
	coated	white cream*	gloss dull
	coated	white	matte
P.H. Glatfelter Co. Spring Grove, Pa. Neenah, Wis.	uncoated	white cream	antique eggshell machine finish
	coated	white	gloss matte
Finch Pruyn & Co. Glens Falls, N.Y.	uncoated	white cream	special order only
Allied Paper Mills Div., SCM Corp. Kalamazoo, Mich.	uncoated lightweight	white cream	special order only
Olin Corporation Fine Paper and Film Div. Pisgah Forest, NC.	uncoated lightweight	white natural	machine finish supercalendered

*Available certain items only.

Table 1
1. Grades for General Publishing - continued

Miami Paper Co. West Carrolton, Ohio	uncoated	white cream	antique eggshell
	film coated	white	matte
Consolidated Papers, Inc. Wisconsin Rapids, Wis.	coated	white	gloss dull matte

Table 1 - continued

2. Grades for Special Purpose Publishing (regularly made or inventoried)[xx]

Curtis Paper Company Newark, Delaware	uncoated	white natural	antique
Howard Paper Company Dayton, Ohio	uncoated	white natural	antique
Mohawk Paper Mills Cohoes, N. Y.	uncoated	white soft white ivory	eggshell
Monadnock Paper Mills Bennington, New Hampshire	uncoated	white natural	antique eggshell smooth

[xx] Generally heavier weights, and made on smaller, slower papermaking equipment; suitable for specialized uses, but not generally economically feasible for commercial publishing.

1/ The above is for informational purposes only, and is not to be considered an endorsement or recommendation.

Grades of paper or their makers listed in this table are those ordinarily for trade, text, reference or scholarly book publishing. No attempt has been made to include papers permanent in nature ordinarily used for other purposes (e.g., record keeping) but unsuitable for book publishing use.

Only those paper manufacturers have been listed who make neutral or alkaline grades as part of a regular product line. Such papers are often available on special order, especially in the case of those suitable for special purpose publishing.

The paper industry continues to evolve in its use of raw materials and processes, and additions to this table, especially in the face of increased demand, are possible.

DEFINITIONS

antique - the roughest surface of uncoated paper normally used in publishing, consequently the bulkiest paper per inch.

coated - paper to whose surface a coating of clay, calcium carbonate or other pigment or mixture of pigments has been added to provide a smoother base for printing.

Dull - coated paper whose surface has been left unpolished or has been otherwise treated to provide a non-reflective appearance for better readability or contrast with gloss inks.

Gloss - coated paper that has been supercalendered (polished) for smoothness. Shiny in appearance.

Matte - a type of coated paper carrying less surface coat weight than dull. Has a non-reflective surface, neither as smooth nor as refined as dull coated.

color - hue or shade, as distinguished from brightness. White, for this purpose, means that the underlying shade of the paper is toward the cold, or blue, end of the spectrum. Paper made with a yellow cast and whose underlying shade is toward the warm, or red, end of the spectrum is variously called natural or (darker) cream, or in some cases, ivory.

eggshell - not as rough as antique and less bulky, but still possessing a noticeable degree of texture.

groundwood - pulp produced by mechanically defibering wood without chemical cooking. The resulting high-yield pulp contains many impurities, notably lignin, which deteriorates markedly on exposure to light and air.

lightweight - a loose term describing paper lighter than 45 lb. (25 x 38 basis) or 67 grams per square meter. Heavily opacified; used for reference books, dictionaries, Bible, etc. Sometimes called "Bible paper" or "thin paper".

machine finish - a "natural" finish as paper comes off the paper machine with only a modest attempt at compacting the web at the machine calender. Smooth to the touch.

supercalendered - paper that has been run through a series of polishing rolls (supercalender) off the paper machine. Very smooth and slick to the touch. Gloss coated paper generally has been supercalendered, and plain paper may be treated in this way.

uncoated - paper whose surface is not covered by clay or other material; also called "plain" paper.

THE COMMITTEE ON PRODUCTION GUIDELINES FOR BOOK LONGEVITY OF THE COUNCIL ON LIBRARY RESOURCES

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